What can I do to reduce air pollution?

Following are a few of the things you can do to improve air quality:

- Limit driving by car pooling, consolidating trips, using public transportation, biking and walking.
- Keep your automobile well tuned and maintained.
- Don't spill gasoline when filling up your car or lawn and garden equipment.
- Participate in your local utility's energy conservation programs. Use water-based or solvent free paints whenever possible and buy products that say "low VOC."
- Seal containers of household cleaners, workshop chemicals and solvents, and garden chemicals to prevent VOCs from evaporating into the air.
- Limit barbecue emissions. Use an electric starter instead of lighter fluid to start charcoal fires, or use an electric, natural gas, or propane grill.
- Cut grass late in the evening or on a cool or overcast day - ozone is created more readily at higher temperatures in the presence of sunlight. Using a gasoline powered lawnmower for one hour produces more VOC than driving a late model automobile 400 miles.

KENTUCKY TRANSPORTATION CABINET

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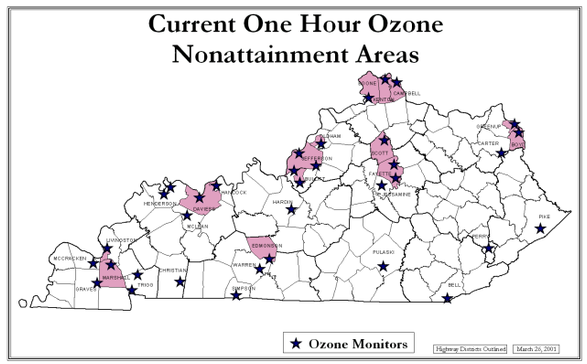
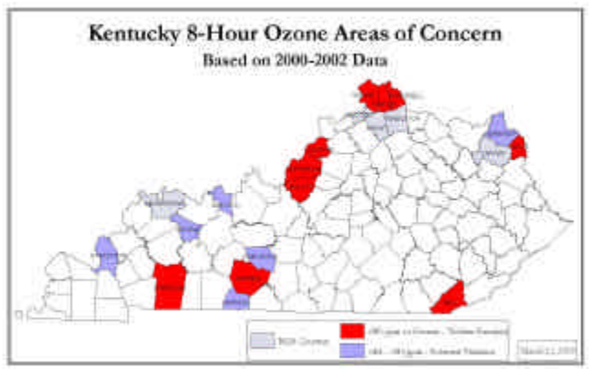
AIR QUALITY FAQ





Air Quality
Frequently Asked Questions

What are the Air Quality Pollutants of Concern?

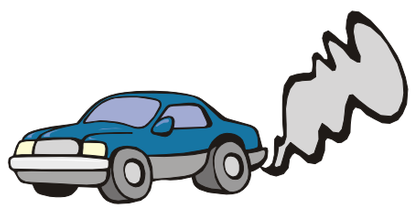
The key transportation-related pollutants are:

- **Ozone (O_3),**
- **Nitrogen Oxides (NOx),**
- **Hydrocarbons (HC), or Volatile Organic Compounds (VOC),**
- **Carbon Monoxide (CO), and**
- **Particulates ($PM_{2.5}$) (pollutants with diameters of 2.5 micrometers or less)**

While upper atmosphere ozone is good, ground level ozone is harmful to human health. Ozone is not emitted, but is created by reactions of NOx and VOC in the presence of sunlight.

Sunlight + NOx + VOC = Ozone

The over 200 million cars and light trucks on American roads account for over 30% of air pollution nationwide. Auto exhaust is a major contributor to NOx levels. Fuel evaporation is a source of VOC.



What are the Air Quality Standards?

In response to the **Clean Air Act (CAA)**, the **U.S. Environmental Protection Agency (EPA)** established **National Ambient Air Quality Standards (NAAQS).** These pollutants adversely affect human health and welfare. Listed are the standards for the principal transportation-related criteria pollutants.

Pollutant	Violation Criteria
Ozone (O_3) (1-hour)	< 1-hour average 0.12 ppm more than 3 times over 3 consecutive years.
Ozone (O_3) (8-hour)	< 8-hour average 0.08 ppm based on a 3 year average of annual 4th-highest daily maximum.
Nitrogen Dioxide (NO_2)	< Annual average 0.05 ppm.
Carbon Monoxide (CO)	<1-hour average 35 ppm more than once per year.
Particulate ($PM_{2.5}$)	< Annual average 15 µg/m^3 based on a 3 year average.

What is a State Implementation Plan (SIP)?

SIP

Air quality is determined by readings from monitors that have been placed at strategic locations. A region can be designated as **nonattainment** for one or more pollutants based on monitor readings that fail to meet the NAAQS. Each designated area can have different nonattainment classifications based upon the severity of violations for each pollutant. The CAA requires that each State develop a **State Implementation Plan (SIP)** for each pollutant for which the State fails to meet the NAAQS. The SIP indicates how and when the State intends to meet the standards. Once the monitors show the

air is improved, the area may be redesignated as **maintenance**. However, such an area must demonstrate that it will continue to meet the NAAQS.

What is an Emission Budget?

Pollution sources are generally classified into one of three different categories - stationary, area, and mobile. **Stationary sources** are relatively large, fixed sources of pollution, such as manufacturing facilities or power plants. **Area sources** consist of other fixed, but smaller facilities, such as gas stations or dry cleaners. **Mobile sources** include on-road sources of pollution, such as cars and trucks, and are linked to the highway and transportation infrastructure. In maintenance areas, each source category is assigned an emission reduction target. **For the mobile source category, the emission target is referred to as a "budget"** and is spelled out in the SIP for current and future years.

The motor vehicle emissions budget represents the highest level of emissions allowed emitted by the area transportation system. The emissions for future years are determined by running the air quality models (MOBILE) using as input forecasted information such as population and employment growth for all projects in the 20-year regional transportation plan .

Maintenance areas must identify ways to offset any emissions increases and expected increases in traffic.

What is Transportation Conformity?

Transportation Conformity is an analytical process required by the CAA to ensure that the transportation projects are in compliance with the State Implementation Plan (SIP). The process involves using EPA developed computer emission factor models (MOBILE 5a, 5b, 6) and dispersion models (CAL3QHC) to determine theoretical on-road mobile source emissions for the area. Inputs to the models include transportation information such as traffic volumes, vehicle types, and average speeds, as well as local climate information. Additionally, the models calculate air quality improvements for various implemented programs such as vehicle emission testing and the use of alternative fuels. In order for the transportation plan to be in transportation conformity, the models must predict emissions less than the allowable mobile source emissions budget as set out in the SIP.

Transportation Conformity analysis is done by the Metropolitan Planning Organization (MPO) or the Kentucky Transportation Cabinet in consultation with EPA and Kentucky Division for Air Quality, and approved by USDOT. This analysis is done at a minimum of every three years or when the 20 year Transportation Plan is modified.

Under the metropolitan planning requirements, projects cannot be approved, funded, advanced through the planning process, or implemented unless those projects are in a fiscally constrained and part of a “conforming” transportation plan.

What is Transportation Conformity Lapse?

What are the Consequences?

An area that can not show “Transportation Conformity” is said to be in “Conformity Lapse”. No new highway or transit projects may advance. The only exceptions are “exempt projects”, which include non-capacity increasing highway projects such as bridge replacements, signalizations, transit, bicycle & pedestrian facilities, safety improvements, and routine maintenance.

If a transportation plan, or project does not meet conformity requirements, transportation officials have the following options:

- Add new measures to improve air quality.
- Delete projects that reduce air quality.
- Work with the appropriate State agency to modify the SIP to offset the plan, program, or project emissions.

What is the Transportation Cabinet’s Role in Reducing Emissions?

Transportation officials participate in decision making for the SIP and allocation of emission reductions to source categories. The State seeks EPA approval to revise SIP strategies if it cannot meet its commitments to reduce emissions from EPA-approved SIP strategies. It is important that the level of emission reductions assigned to each of the major pollution sources be achieved through the implementation of approved programs.


Interagency Consultation

The conformity regulation requires that federal, state and local agencies establish formal procedures to ensure interagency coordination. Transportation officials are responsible for finding ways to reduce emissions from on-road mobile sources. Emission reduction of mobile sources can be achieved through:

- programs that address vehicle emissions (e.g., gas cap replacements, the use of reformulated gasoline, implementation of Inspection and Maintenance programs)
- changing travel patterns (e.g., ridesharing or use of transit)
- transportation investments to reduce congestion through signal synchronization programs, adding turning lanes and incident management.

Additionally, the Transportation Cabinet has the responsibility for administering the Congestion Mitigation and Air Quality Improvement Program (CMAQ) as legislated by Transportation Equity Act for the 21st century (TEA-21). This program provides funding for projects areas with air quality concerns.
CMAQ projects include intersection improvements, traffic signals synchronization, leaking gas cap replacements and various transit projects. Intelligent Transportation Systems such as the ARTIMIS system (www.artimis.org) in the Northern Kentucky/Cincinnati and TRIMARC in the Louisville area.

Can we forecast pollution levels?

Models, taking into account wind patterns, forecasted temperatures, and other weather conditions, have been created to forecast ozone levels for up to 48 hours ahead. During ozone season, some metropolitan areas include the air quality forecast as a part of their evening weather forecast. Based on these forecasts, individuals can make decisions and take actions that either reduce their health risk or reduce air pollution or both. During the ozone season, the Lexington, Louisville and Northern Kentucky area ozone forecasts are available online at www.lfucg.com/ozone and www.apcd.org and www.oki.org, respectively. Additionally, you can view regional and national forecasts at the EPA AIRNOW website: www.epa.gov/airnow.

What does AQI stand for?

AQI stands for Air Quality Index. This index was created for reporting daily air quality. AQI is calculated for each pollutant and ranges from 0 to 500, with a value of 0 being good and 500 being hazardous. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. Typically, the AQI is reported as the highest value occurring among all pollutants. You can find more information regarding AQI at the EPA AIRNOW website.